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PATENT APPLICATION

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IN THE  
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Steve Dunfield et al

Confirmation No.: 2192

Application No.: 10/765402

Examiner: Saira Raza

Filing Date: Jan 27, 2004

Group Art Unit: 1711

Title: METHOD OF MAKING MICROCAPSULES UTILIZING A FLUID EJECTOR

Mail Stop Appeal Brief - Patents  
Commissioner For Patents  
PO Box 1450  
Alexandria, VA 22313-1450

TRANSMITTAL OF REPLY BRIEF

Transmitted herewith is the Reply Brief with respect to the Examiner's Answer mailed on Feb 22, 2007.

This Reply Brief is being filed pursuant to 37 CFR 1.193(b) within two months of the date of the Examiner's Answer.

(Note: Extensions of time are not allowed under 37 CFR 1.136(a))

(Note: Failure to file a Reply Brief will result in dismissal of the Appeal as to the claims made subject to an expressly stated new ground rejection.)

No fee is required for filing of this Reply Brief.

If any fees are required please charge Deposit Account 08-2025.

Respectfully submitted,

Steve Dunfield et al

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

<b>Inventors:</b>	<b>John Stephen Dunfield et al.</b>	<b>Examiner:</b>	<b>Saira Raza</b>
<b>Application No:</b>	<b>10/765,402</b>	<b>Group Art Unit:</b>	<b>1711</b>
<b>Filing Date:</b>	<b>January 27, 2004</b>	<b>Confirmation No:</b>	<b>2192</b>
<b>Title: Method of Making Microcapsules Utilizing A Fluid Ejector</b>			

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**REPLY BRIEF TO EXAMINER'S ANSWER UNDER 37 CFR §41.3?**

TO THE ASSISTANT COMMISSIONER FOR PATENTS:

Dear Sir/Madam:

This Reply Brief is presented in response to the Examiner's Answer mailed February 22, 2007, and in support of the Notice of Appeal filed August 31, 2006 and the Appeal Brief filed October 31, 2006, appealing the rejection of claims 1-30, 32-34, 39-41, 46-57, 59-61, and 66-67 of the above-identified application as set forth in the Final Office Action mailed July 31, 2006.

## **Argument**

### **Reply to Examiner's Response to Arguments**

#### **A. Claim rejections - 35 U.S.C. §102**

Appellants continue to assert that the rejection of claims 1-2, 4-8, 11-14, 17-18, 46-47, and 49 under 35 U.S.C. §102(b) as being anticipated by Loughman (WO 99/38535, "Loughman") is improper.

The Examiner's discussion of the Grounds of Rejection of the Examiner's Answer is addressed in Appellants' Appeal Brief. The following is Appellants' reply to the Examiner's arguments in the Response to Argument section, which begins on page 14 of the Examiner's Answer. In the Examiner's Answer, the Examiner maintains that the proper interpretation of "essentially a drop" when interpreted in light of Appellants' specification clearly sets forth that "essentially a drop" does not exclude the generation of more than a drop and that the generation of one million drops is considered to be within the scope of the claim as per MPEP §2111.03. Appellants assert in regards to the claim limitation "essentially a drop" Examiner must give that limitation the broadest reasonable interpretation consistent with the specification.<sup>1</sup> "The lucidity of a claim is determined in light of what ideas it is trying to convey. Only by knowing the idea, can one decide how much shadow encumbers the reality. The very nature of words would make a clear and unambiguous claim a rare occurrence. Writing on statutory interpretation, Justice Frankfurter commented on the inexactitude of words: They are symbols of meaning. But unlike mathematical symbols, the phrasing of a document, especially a complicated enactment, seldom attains more than approximate precision. If individual words are inexact

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<sup>1</sup> *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000) (cited in MPEP §2111.)

symbols, with shifting variables, their configuration can hardly achieve invariant meaning or assured definiteness. Frankfurter, *Some Reflections on the Reading of Statutes*, 47 Col.L.Rev. 527, 528 (1947)."<sup>2</sup> "Often the invention is novel and words do not exist to describe it. The dictionary does not always keep abreast of the inventor. It cannot. Things are not made for the sake of words, but words for things."<sup>3</sup>

Appellants note, Examiner has not rejected claims 1 and 46-47 for indefiniteness in regards to the limitation "essentially a drop" for claims 1 and 47 and "essentially a fluid drop" for claim 46 even though Examiner's argument is based on what the broadest reasonable interpretation of "essentially" is in regards to how many drops is claimed by the limitation "essentially a drop." Appellants argue that clearly the use of words of degree or relative terms does not automatically render a claim indefinite under Section 112, second paragraph.<sup>4</sup> When a term of degree or a relative term is recited in a claim, the first determination is whether the specification provides some standard for measuring the degree.<sup>5</sup> Appellants assert that Appellants' specification:

"the ejection of a precise quantity of fluid in the form of essentially a fluid drop with the drop ejected substantially along fluid ejection axis 148. Each fluid drop may include primary drop 146 as well as possible secondary drops 144. Both the generation and size of the secondary drops depends on various parameters such as the firing frequency of fluid ejector 126, the surface tension of the fluid being ejected, the size and shape of nozzle 142, and the size, shape, and location of fluid ejector 126 to nozzle 142,"

clearly provides a standard for measuring the degree. Appellants note that the specification provides further information in regards to a standard in stating "[f]luid ejection device 102 differs from conventional fluid ejectors such as hydraulic, air

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<sup>2</sup> *Autogiro Co. of America v. U. S.*, 384 F.2d 391, 396, 155 U.S.P.Q. 697 (Ct. Cl. 1967).

<sup>3</sup> *Id.* at 397.

<sup>4</sup> *Seattle Box Co. v. Industrial Crating & Packaging, Inc.*, 731 F.2d 818, 221 USPQ 568, 573-574 (Fed. Cir. 1984).

<sup>5</sup> *In re Oetiker*, 951 F.2d 1267, 23 USPQ2d 1661, 1662 (Fed. Cir. 1991) (unpublished) (citing *Seattle Box*).

assisted, or ultrasonic nozzles in that *rather than forming a spray of fluid having varying drop sizes*, this embodiment, utilizes a *drop generator that creates fixed-sized drops that are discretely ejected*. Page 6, lines 19-23, (*Emphasis added*). Where an explicit definition is provided by the applicant for a term, that definition will control interpretation of the term as it is used in the claim.<sup>6</sup> Even if the specification does not provide sufficient guidance Examiner must make a determination as to whether one of ordinary skill in the art, in view of the prior art, would nevertheless be reasonably apprised of the scope of the invention. Appellants assert that no one of ordinary skill in the art in view of the cited prior art and Appellants specification would reasonably interpret "essentially a drop" as encompassing a million drops as Examiner asserts in Examiner's answer.

Appellants also rely on various court interpretations of words of degree or relative terms and believe that these court interpretations further strengthen Appellants' argument. The term "essentially" has been both held to generally be considered definite and the court in regards to the limitation "essentially free of alkali metal" to indicate to a person of ordinary skill in the art that it means unavoidable impurities of alkali metals in starting materials and essential ingredients, i.e. a small amount of alkali metal would be envisioned, e.g. 4 ppm alkali metal but not 3,819 ppm alkali metal.<sup>7</sup> "Insofar as it requires appellants to specify a particular *number* as the cutoff between their invention and the prior art, the PTO's position is impractical. Appellants' invention does not reside in such a number."<sup>8</sup> It is impractical to require

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<sup>6</sup> See, *Toro Co. v. White Consolidated Industries Inc.*, 199 F.3d 1295, 1301, 53 USPQ2d 1065, 1069 (Fed. Cir. 1999).

<sup>7</sup> *In re Marosi*, 710 F.2d 799, 803, 218 USPQ 289, 292 (Fed. Cir. 1983).

<sup>8</sup> *Id.* at 802. At 801-802 the board explained we are well aware that the terminology employed in a claim does not stand alone but must be viewed in the light of the disclosure. However, even when the claims are read in this manner, we fail to find any disclosure in the specification that would tend to indicate just how much alkali metal could be present and still remain within the limitations set forth. Under ordinary circumstances, the disputed phrase would not form a significant part of the claimed subject matter; however, in the present case, it is the determining factor that appellants rely upon to distinguish over the applied prior art. Appellants argue that the compositions relative to freedom from alkali metal serve to distinguish over the prior art disclosure, but nowhere are we able to locate a teaching or disclosure that defines an upper limit that would create a patentable distinction over the prior art. As we find no adequate guidelines to the scope of the disputed phrase and in view of its importance in determining the scope of the claimed subject matter, we will affirm the rejection . . .

applicants to specify a particular number as a cutoff between the claimed invention and the prior art.<sup>9</sup> Although this case involved a rejection based on indefiniteness Appellants assert *In re Marosi* is analogous to the instant case since Marosi was using the term "essentially" to limit alkali metals below a few ppm as compared to the prior art of over a 1,000 ppm. In addition, the word "essentially" has also been interpreted to have a meaning similar to that of the word "about."<sup>10</sup> In *Eiselstein* the Court held that "essentially" is a vague term which connotes a degree of approximation or imprecision.<sup>11</sup> Further, in *Bailey v. Dunkin Donuts, Inc.*, the Court held in a non-precedential case the phrase "essentially vertical" should be interpreted in accordance with its ordinary meaning as "90 degrees plus or minus a few degrees and that 62-68 degrees is outside of the range claimed by using the phrase "essentially vertical."<sup>12</sup> Again, Appellants assert *Bailey* is analogous to the instant case by allowing for a degree of imprecision but it does not allow, Appellants would argue, the claim limitation "essentially vertical" to have the meaning of any angle between 0 and 90 degrees.

Appellants are clearly claiming a device that ejects "essentially a drop" which includes a primary drop as well as possible secondary drops for each activation of said fluid ejector but are not claiming a spray, or tens of thousands, or millions of drops as released by an ultrasonic atomizer disclosed in Loughman. Appellants point out the even the Examiner has problems with the limited words available when describing Examiner's interpretation by inaccurately stating, on page 15 of Examiner's answer, "i.e. each fluid drop may include greater than two drops." Appellants ask how can "a drop" be greater than two drops. Such a statement simply makes no sense since a drop is a drop and more than one drop is usually conveyed by the plural drops. Appellants argue the phrase "essentially a drop" places the reader on notice that not

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"[W]e challenge appellants to show on this record where one skilled in the art would draw the 'essentially free of alkali metal' line between 4 ppm and 3,819 ppm.

<sup>9</sup> *Id.* at 802-803 (citing *In re Mattison*, 509 F.2d 563, 184 U.S.P.Q. 484 (CCPA 1975).

<sup>10</sup> *Eiselstein v. Frank*, 52 F.3d 1035, 34 U.S.P.Q.2d 1467 (Fed. Cir. 1995).

<sup>11</sup> *Id.*, 34 U.S.P.Q.2d at 1470-71.

<sup>12</sup> 135 F.3d 775, 45 U.S.P.Q.2d 1683 (Fed. Cir. 1998) (unpublished - cannot be cited as precedent).

only a single drop is claimed but that slightly more than a single drop is also envisioned, e.g. a few but not many.

What Examiner is apparently arguing is that words of degree or relational words either have no meaning or must also fall with Examiner's categories of only claiming a single drop or claiming an infinite number of drops, i.e. Examiner appears to say that "essentially" cannot be used in a claim to claim the possibility of the range from one to a few drops it can only be interpreted as claiming more than one drop which includes an infinite number of drops. Appellants are not arguing that a drop is greater than two drops as such an argument Appellants believe does not make sense. Appellants are arguing that the limitation "essentially a drop" when read in view of the specification means either a single primary drop or a primary drop plus possibly a few secondary or satellite drops that may also form during the ejection of the primary drop. Thus, Appellants are arguing that the limitation "essentially a drop" can be greater than two drops but less than a thousand, or tens of thousands, or millions of drops.

In addition, Examiner on page 15 of Examiner's Answer argues that because Appellants use the open-ended transitional word "comprising" the "claim does not exclude the generation of more than one drop . . . [and] [f]urther, the generation of one million drops is considered to be within the scope of the claim as per MPEP §2111.03." Appellants respectfully disagree with Examiner's interpretation of the effect of comprising and Examiner's interpretation of MPEP §2111.03. Appellants agree that the transitional word "comprising" is open-ended and does signal the person of ordinary skill in the art that the claimed method may include other steps. However, the term comprising does not signal that "the entire claim is presumptively open-ended" where by open-ended means that the meaning of the elements/limitations that are contained in the claim can be interpreted in the future to have a entirely different meaning. Section 2111.03 is clear in stating that the transitional term "comprising" is inclusive or open-ended and **does not exclude** additional, unrecited elements or method steps. Section 2111.03 does not say that "comprising" is open-ended and therefore the recited essential elements or essential method steps can be changed or

modified such that the scope of the claim is changed. Section 2111.03 only states that other elements or method steps may be added and still form a construct within the scope of the claim. Examiner's assertion that Appellants use of the transitional term "comprising" inputs a particular meaning to the limitation "essentially a drop" is clearly erroneous and without merit.

Further, Examiner on page 15 of Examiner's Answer argues, that even if as Appellants have suggested that "essentially" should be interpreted to have a meaning similar to that of the word "about," the phrase "essentially a drop" allows for less than a drop and more than a drop and hence the claimed phrase does not exclude more than one drop. This is despite the fact that Examiner has acknowledged that about "allows for values slightly above and below a particular value," citing MPEP §2144.05. Appellants assert that Examiner's argument simply strengthens Appellants argument that Examiner is clearly arguing that one can claim a drop, a specific number of drops, or an infinite number of drops and no relational word or word of degree can have any meaning in between. If this is not true then how can one reconcile that Examiner admits the term "about" allows for some small degree of variation and still reasonably equate that the limitation "essentially a drop" can only mean one or more drops with no limitation on the word "more." Appellants note that even the word "a" is generally interpreted to mean one or more.<sup>13</sup>

Accordingly, for the reasons set forth above, as well as the reasons set forth in the Appeal Brief filed October 31, 2006 Appellants assert that Examiner's argument that the claim limitation "essentially a drop" can have only the meaning of one or more is clearly erroneous and an unreasonably broad interpretation of the limitation "essentially a drop" when read in view of the specification and when read in view of the court opinions set forth above and in view of Appellants Appeal brief. Appellants

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<sup>13</sup> *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 52 U.S.P.Q.2d 1109, 1112 (Fed. Cir. 1999), *cert denied*, 529 U.S. 1066 (2000); (citing *Abtox, Inc. v. Exitron Corp.*, 122 F.3d 1019, 1023, 43 U.S.P.Q.2d 1545, 1548 (Fed. Cir. 1997) ("The article 'a' suggests a single chamber. However, patent claim parlance also recognizes that an article can carry the meaning of 'one or more,' for example in a claim using the transitional phrase 'comprising.'")).

continue to assert that Examiner's interpretation is in contradistinction to what one of ordinary skill in the art would interpret for such claim language.

Appellants submit that the Loughman patent does not teach or suggest "essentially a drop" found in independent claims 1 and 46-47. Accordingly, Appellants submit that independent claims 1 and 46-47 are patentably distinct from the Loughman patent for this reason alone and that all dependent claims that depend therefrom are also patentably distinct.

In regards to Examiner's argument based on the limitation "activating a fluid ejector at a frequency greater than 10kHz." Appellants assume for purposes of this reply brief that Examiner in the middle of page 16 of Examiner's Answer stated "appellants usages of the term 'consisting' . . . ," meant to say "comprising." If Examiner does mean "consisting" then Appellants have no idea what Examiner's argument is referring to as Appellants are unaware of having used the term "consisting" in any arguments or claim interpretation. If, Examiner is asserting Examiner's argument around the transitional word "comprising" then Appellants argue as above such argument is clearly improper. Appellants are unaware and Examiner has provided nothing in the record asserting that the term "activating" in patent claim parlance carries the same meaning as "operating" in a claim using the transitional phrase "comprising." Appellants assert that "activating" has a plain an ordinary meaning as well as "operating" has a plain and ordinary meaning which are typically or generally different from each other without more disclosed in Loughman. In addition, Appellants assert that Examiner's statement, on page 16 of Examiner's Answer, "appellants usages[sic] of the term "consisting"[sic]," does not exclude continuous operation above a set frequency is immaterial in the interpretation of the claim limitation. Even if "comprising" allows for continuous operation the continuous operation must be consistent with the other limitations and continuous cannot modify the interpretation of the term activating to broaden it. It can only modify the claim to further narrow it. Appellants assert by definition adding an additional limitation can only narrow a claim it cannot broaden it. Appellants assert that claims 1 and 46-47

could further include the limitation of continuous operation; however, even if that limitation is added the fluid ejector would still be activated at a frequency greater than 10 kilohertz. Appellants note Examiner appears to confuse activation with operation. As an analogy Appellants argue a timer may have a quartz crystal oscillator that operates at a given frequency which may be adjustable and which is utilized in keeping time; however, the timer can be activated at a completely different and separate frequency than the oscillator. In analogy the Examiner apparently is arguing that the time is activated at the oscillator frequency which is clearly in error. In addition, Appellants assert that it is well known that an ultrasonic atomizer utilizes the phenomenon known as cavitation (e.g. microscopic bubbles expanding and collapsing on the surface vibrated at the frequency regime cited in Loughman). Appellants assert that although the vibration frequency results in formation of microdroplets the frequency of vibration is not directly related to frequency of ejection of the microdroplets. Rather Appellants assert the rate at which the liquid is atomized depends, within limits, solely on the volume that is being delivered onto the atomizing surface and the frequency where generally the higher the frequency, the lower the processing capability in contradistinction to Appellants' claimed invention. Appellants further assert that clearly Loughman does not expressly disclose "activating a fluid ejector at a frequency greater than 10 kHz," and therefore Examiner must be relying on Loughman inherently disclosing Appellants' claim limitation. Appellants note that the Federal Circuit in *Continental Can Co. U.S.A. v. Monsanto Co.*, has explained the operation of inherency in anticipation.<sup>14</sup>

"To serve as an anticipation when the reference is silent about the asserted inherent characteristic, such a gap in the reference may be filled with recourse to extrinsic evidence. Such evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by a person of ordinary skill. . . . [which] accommodates situations where the common knowledge of technologists is not recorded in the reference . . . ."<sup>15</sup>

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<sup>14</sup> 948 F.2d 1264, 20 U.S.P.Q.2d 1746, (Fed. Cir. 1991).

<sup>15</sup> *Id.* at 1264, 1268-69, 20 U.S.P.Q.2d at 1749-1750.

Appellants also note that Examiner has not provided any extrinsic evidence in the record and has only provided bald assertions or conclusory statements that Loughman discloses Appellants claimed limitation. Appellants assert the lack of a reasoned explanation, based on sound technical and scientific reasoning, along with the lack of any extrinsic evidence placed in the record by the Examiner is insufficient to establish a *prima facie* case of anticipation based on inherency. Appellants assert to establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.<sup>16</sup> Examiner in relying on the transitional word "comprising" appears to be relying on the fact that Loughman could activate at a frequency above 10 kHz. Appellants do not know whether such a modification could be made to Loughman but that even if it could it does not expressly or inherently describe "activating a fluid ejector at a frequency greater than 10kHz.," because to require modification of an anticipatory reference is not sufficient to support anticipation based on inherency.

Once again, Appellants note that to anticipate a claim under 35 U.S.C. 102, a reference must teach every element of the claim. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) ("A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference").

Thus, for the reasons set forth above, as well as the reasons set forth in the Appeal Brief filed October 31, 2006, Appellants submit that the Loughman patent does not teach or suggest each and every element of independent claim 1 and 46-47. Accordingly, Appellants submit that independent claims 1 and 46-47 are patentably distinct from the Loughman patent. Furthermore, as dependent claims 2-30, 32-34, and 39-41 further define patentably distinct claim 1 and dependent claims 48-56, 58-61, and 66-67 further define patentably distinct claim 47 Appellant submits that these

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<sup>16</sup> *Id.*

dependent claims are also patentably distinct from the Loughman patent. Appellants further submit that withdrawn claims 31, 35-38, and 42-45 further define patentably distinct claim 1 and withdrawn claims 57, 62-65, and 68-72 further define patentably distinct claim 47. Accordingly Appellants, respectfully submit that the rejection of claims 1-2, 4-8, 11-14, 17-18, 46-47, and 49 under 35 U.S.C. 102(b) is not correct and should be withdrawn, and Appellants respectfully submit because the other cited references do not cure the deficiencies of Loughman claims 1-72 should be allowed based on the arguments presented above and in Appellants' Appeal Brief filed October 31, 2006.

Further, in regards to claims 46-47, and 2 Examiner, on page 17 of Examiner's Answer, Examiner states "that appellants have defined in the claim the requirements of a drop on demand fluid ejector. Appellants claim a drop on demand fluid ejector device and require that device ejects essentially a drop of fluid." Appellants raise four issues in regards to Examiner's Answer to these particular claim rejections

First, Appellants note that drop-on-demand is a well known term of art that refers to devices that eject a drop for each activation of the fluid ejector that converts electrical energy into mechanical energy sufficient to eject a drop. Appellants assert that it is also widely known that inkjet type fluid ejectors both continuous, as well as drop-on-demand thermal and piezoelectric type devices do not in fact always eject only a single drop but rather eject a primary drop plus possible secondary or satellite drops. To demonstrate this understanding in the prior art Appellants present a few examples from issued Patents. U.S. Patent 6,126,282 assigned to Canon states "[b]y the way, when ink is ejected, there are occasions that a satellite drop is generated following the main drop thereof, and it is also conventionally known that in such a case, if the ejecting direction or angle of the main drop and that of the satellite drop is different from each other, an adverse effect is caused to the printed result." Col. 1, lines 34-40. U.S. Patent 6,527,369, assigned to Hewlett-Packard states "[w]hen a drop is expelled from an orifice due to the rapid boiling of the ink inside the firing chamber, most of the mass of the ejected ink is concentrated in the droplet which is

directed toward the medium. However, a portion of the expelled ink resides in a tail extending from the droplet to the surface opening of the orifice. . . . Some of the ink on the severed tail forms subdroplets ("spray") which spreads randomly in the general area of the ink droplet." Col. 2, lines 3-18. U.S. Patent 6,666,535 assigned to Xerox states "[w]hen a main drop of an ink drop is ejected at a speed greater than certain values (e.g., approximately 5 m/sec), the main drop is accompanied by one or more small sub-drops called satellite drops. Satellite drops are usually smaller than the main drop and travel at a lower speed than the main drop. As a result, satellite drops can land on different locations of the image receiving member (e.g., a sheet of paper) relative to the main drop during printing when the drop ejector and the image receiving member are moving relative to each other. Another factor that can cause satellite drops to land at different locations than the main drop is that satellite drops generally have a velocity vector that is slightly different from that of the main drop." Col. 1, lines 13-16.

Appellants assert that these few examples clearly demonstrate that the term of art "drop-on-demand fluid ejector" is generally known to eject essentially a drop, i.e. a primary drop and sometimes depending on the conditions a few secondary or satellite drops. Appellants note that there is over a 1000 issued patents which describe various drop-on-demand fluid ejection devices and the vast weight of that evidence is consistent with Appellants interpretation of the claim language in contention with this case.

Second, on page 18 of Examiner's answer Examiner states "[t]he examiner recognizes that the term "drop on demand fluid ejection device" when given the broadest reasonable interpretation consistent with (1) the specification, and (2) the interpretation that those skilled in the art would reach, is not equivalent to the definition provide[d] by appellant in the claim." Appellants traverse Examiner's statement that Appellants have given a definition to the term that is in contradiction to the definition that those skilled in the art would give. Rather, clearly it is Examiner that is giving that is in contradiction to the accepted definition. Examiner clearly states the claim defines the term. Appellants respectfully disagree with Examiner and assert there is no

authority that Examiner has cited which either requires Appellants to define a term of art in the actual claim language or that a limitation which is clearly consistent with the accepted definition of a term somehow changes that definition notwithstanding its consistency with the accepted definition. Examiner appears to be asserting that because Appellants have used the term "essentially a drop" (which Examiner wants to give an unreasonably broad interpretation to) Appellants have modified the definition drop-on-demand type fluid ejectors from its generally accepted definition. Appellants in the specification, on page 6, lines 19-23, have clearly stated that an ultrasonic atomizer is not a drop-on-demand type fluid ejector.

Third, Examiner on page 17 states "[c]learly, the claim provides the standard for determining what explicitly must be present in the drop on demand fluid ejector, and one of ordinary skill in the art would reasonably comprehend that the only requirement of the claimed drop on demand fluid ejector is that the device is capable of generating essentially a drop of fluid. Appellants traverse this statement and argue that Examiner is clearly in error using one limitation, namely "essentially a drop" as the only requirement of Appellants claimed drop on demand fluid ejector. Appellants assert that if "essentially a drop" is consistent with the normal and ordinary meaning of a drop on demand fluid ejector may generally include other features or attributes those features and attributes are not excluded simply because Appellants have only cited one attribute. Examiner appears to confuse the definition or meaning of a claim term with whether or not the claim term is disclosed in the prior art. Appellants argue the latter is separate from the former. Examiner can argue the claim term is disclosed in the prior art but it is improper for the Examiner to argue the claim elements/limitations themselves are defined only by what is in the claim. Further, Appellants assert that Examiner's interpretation is improper given Examiner's arguments based on using the transitional term "comprising." Examiner for one limitation asserts that the term comprising is open-ended and therefore makes reasonable some very broad interpretation but then with another limitation Examiner ignores the use of comprising and restricts the claim language to only that which is disclosed in order to decipher some limited definition that fits Examiner's argument for that particular limitation.

Appellants assert Examiner's argument is inconsistent with accepted norms of claim interpretation and is therefore improper.

Thus, Appellants assert that clearly Loughman does not expressly or inherently disclose a drop on demand fluid ejector as disclosed in claims 46-47 and claim 2.

Fourth, Examiner, on page 18 of Examiner's Answer relies on inherency in response to Appellants argument that Loughman does not disclose "producing a distribution of n fluid drop volumes, wherein each drop volume of said n fluid drops is within about 10 percent of a specified drop volume," as claimed in independent claim 46. Appellants continue to assert the arguments set forth in Appellants' Appeal Brief filed October 31, 2006. As Appellants have argued above Examiner has provided no extrinsic evidence in the record to support Examiner's finding that Loughman inherently discloses Appellants claimed invention. Further, Appellants believe that a quick glance at Figs. 1b and 1c of Appellants' specification clearly distinguishes the two as shown below.

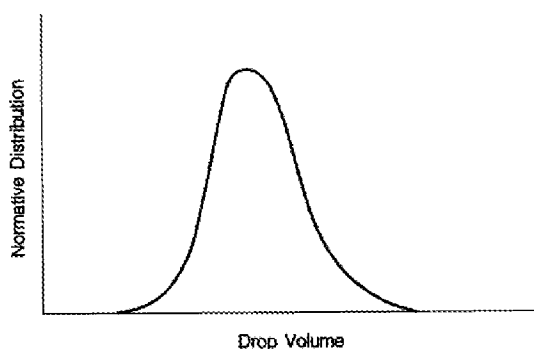


Fig. 1b

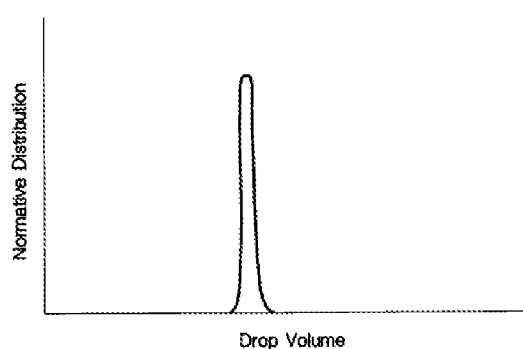


Fig. 1c

On page 6 line 23 continuing to page 7 line 7 of Appellants' specification states " Fig. 1b is a graph describing the normalized distribution of drop volume for conventional fluid ejectors utilizing hydraulic, air assisted, or ultrasonic nozzles. The particular drop volume distribution depends on the nozzle type and generally varies from one type to another. In addition, other factors such as the fluid properties, nozzle capacity, and spraying pressure also effect the drop volume. As is illustrated in Fig. 1b

conventional fluid ejectors generally have a broad distribution of drop volumes. Fluid ejection device 102 differs from conventional fluid ejectors in that rather than forming a spray of fluid having varying drop volumes, activation of drop ejector 126 generates substantially fixed size drops that are discretely ejected. Fluid ejection device 102, on the other hand utilizes a method of creating discrete sized drops that are independently ejected from a particular nozzle utilizing a particular fluid ejector while maintaining a narrow drop volume distribution as shown in Fig. 1c. In addition, the narrow drop volume distribution is maintained over multiple nozzles each having a separate fluid ejector and fired independently or simultaneously."

Appellants assert that the claim limitation involving a distribution of drop volumes found in claim 46 when read in view of the specification and when read in view of the vast weight of prior art that is in support of Appellants position that Loughman does not disclose a drop on demand fluid ejector device there is clearly no basis for Examiner to assert that Loughman inherently discloses such a distribution. Even if Examiner is correct that Loughman discloses a drop on demand fluid ejector Examiner's assertion that it must inherently disclose "producing a distribution of n fluid drop volumes, wherein each drop volume of said n fluid drops is within about 10 percent of a specified drop volume," Appellants assert, is equivalent to stating that all ultrasonic atomizers inherently have the same properties and behaviors, i.e. there can be no difference. Examiner has provided no extrinsic evidence in the record suggesting that Appellants are incorrect. Appellants note Loughman is silent on this issue which is why Examiner must assert Loughman inherently discloses the claimed subject matter. This is equivalent to saying that a 6 cylinder engine inherently has exactly the same properties as a V8 engine since one could conceivably claim both with the same claim language, or that an Apple computer inherently must have the same properties as an IBM compatible PC again since one could conceivably claim both with the same claim language. Clearly such a position is untenable. Appellants assert Examiner's reasoned explanations are incorrect in regards to claim 46. In addition, the total lack of any extrinsic evidence present on the record, Appellants

argue clearly shows the Examiner has failed to establish a *prima facie* case of anticipation in regards to independent claim 46 for this reason alone.

Thus, for the reasons set forth above, as well as the reasons set forth in the Appeal Brief filed October 31, 2006, Appellants submit that the Loughman patent does not teach or suggest each and every element of independent claim 46. Accordingly, Appellants submit that independent claim 46 is patentably distinct from the Loughman patent. Accordingly, Appellants respectfully submit that the rejection of claim 46 under 35 U.S.C. 102(b) is not correct and should be withdrawn.

In regards to claims 4-6 Examiner, at the bottom of page 18, states simply "[s]ee Response to Arguments under claim 1 for the rejection of claims 4-6. Appellants note that Examiner has provided no response other than Examiner's assertion in regards to claim 1 that Loughman discloses "wherein each activation of said fluid ejector generates essentially a drop," in regards to the limitation activating a fluid ejector. Appellants note that on page 5 of Examiner's answer Examiner states clearly that the elements/limitations of claims 4-6 are inherently disclosed in Loughman. Appellants assert that as argued above to establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Appellants note other than Examiners conclusory statements there is nothing in the record to establish that Loughman inherently establishes the subject matter of claims 4-6.

In regards to claims 12-13 Examiner on page 19 of Examiner's Answer states that Loughman would envisage employment of any suitable ultrasonic atomizer including an electric discharging atomizer having the properties of the claim. First Appellants have no idea how an anticipatory prior art reference can envisage employment of any suitable device and thus be a proper anticipation rejection. Appellant can only assume that Examiner may be using envisage to suggest inherency. Again Appellants note that on page 5 of Examiner's answer Examiner

states clearly that the elements/limitations of claims 12-13 are inherently disclosed in Loughman. As argued above for claims 4-6 there is no extrinsic evidence in the record to support Examiner's assertion. Thus, other than Examiner's conclusory statements there is nothing in the record to establish that Loughman inherently establishes the subject matter of claims 12-13. In addition, Appellants assert that the lack of extrinsic evidence is particularly important in regards to claims 12-13 because Appellants believe if an electric discharging atomizer does exist then Appellants believe that it would operate in a manner quite distinct from an ultrasonic atomizer.

In regards to claims 17 and 18 Examiner on page 19 of Examiner's Answer states that Loughman discloses a homogenizer Loughman's homogenizer is equivalent to Appellants' chamber. Appellants note that Loughman discloses the homogenizer may be an Ultra-turrax T25 (IKA, Staufen Germany) with dispersing tools attached. Page 10 lines 18-19 of Loughman. Below Appellants show the product data sheet Appellants representative located on the web at:  
[http://www.ika.net/ika/data\\_sheet.php?iCompany=7&iProduct=3565000&iLang=1&filename=DataSheet\\_T\\_25\\_digital\\_ULTRA-TURRAX%20.pdf](http://www.ika.net/ika/data_sheet.php?iCompany=7&iProduct=3565000&iLang=1&filename=DataSheet_T_25_digital_ULTRA-TURRAX%20.pdf) . Appellants note that as best Appellants can determine the homogenizer shown below is the one referenced in Loughman. IKA and ULTRA-TURRAX are a registered trademarks of IKA Works Inc. Appellants believe that even if this is not the homogenizer referred to in Loughman that it at least is representative of homogenizers in general and clearly shows that a homogenizer is not a chamber.

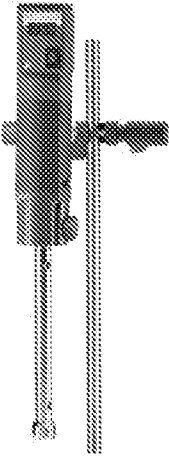
Appellants also show a diagram below taken from the operating manual for the Ultra-turrax T25 which clearly shows the homogenizer being inserted into a beaker and does not show any chamber let alone a chamber which is part of the ultrasonic atomizer. The operating manual was found on the web at the following URL:

[http://www.ika.net/ika/product\\_art/manual/ika\\_t\\_25\\_d.pdf](http://www.ika.net/ika/product_art/manual/ika_t_25_d.pdf)

The image shown below was found on page 4 of the manual and clearly shows the homogenizer lowered into a beaker that contains a solution. There is no indication

of a chamber and there clearly is no indication that the homogenizer is connected to the ultrasonic atomizer to act as a chamber for the atomizer.

**Product Data Sheet**



The new T25 TRA-TD (5000) high-performance disperser by IKA®

- For volumes of 1 to 2000 ml (5420)
- The maximum of applications ranges from homogenizing waste water samples to the use in laboratory reactors, to dispersion fields under vacuum, pressure and sample preparation in medical diagnostics
- Three types of shaft design
- Standard version with digital display
- Proven design configurations have many years of proven, guaranteed compatibility of test results

**IKA®**

**T 25 digital ULTRA-TURRAX®**

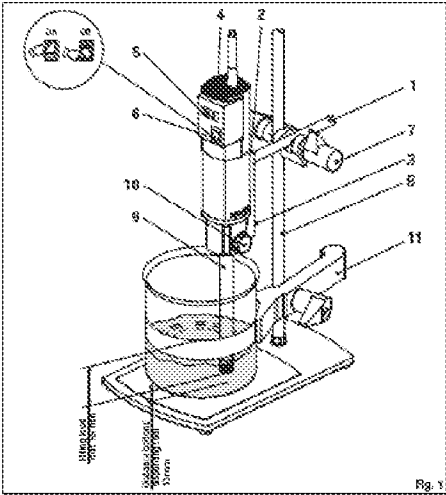


Fig. 1

Technical Data			
Motor rating input [W]	800	Motor rating output [W]	500
Volume range min. [ml] [l]	0,010	Volume range max. [ml] [l]	2
Viscosity max. [mPa·s]	9000	Speed range [rpm]	5400 - 24000
Speed deviation [%]	±1	Speed control [°]	analogous
Speed display [°]	LED	Noise without element [dB(A)]	70
Extension of motorhead [mm]	12	Extension arm length [mm]	175

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Pos.	Bezeichnung	Item	Designation
1	Auslager	1	Boom
2	Zylinderschraube	2	Cheese-head screw
3	Drehzahlmesseranschluss	3	Tachometer connection
4	Stellrad	4	Adjustment wheel
5	LED-Display Drehzahl	5	LED-Display speed
6	Ein-/Aussschalter	6	On/Off-switch
7	Kreuzmuffe	7	Cross sleeve
8	Stator	8	Stand
9	Dispersierwerkzeug	9	Dispersion tool
10	Drehgriff	10	Turning handle
11	Spannhalter	11	Tensioner

Further, in regard to claims 17 and 18 each claim includes the element/limitation "a nozzle layer" which Appellants assert is not expressly or inherently disclosed in Loughman because an ultrasonic atomizer does not necessarily have a nozzle formed in a nozzle layer. Appellants assert it may have a nozzle layer formed in a nozzle layer but it may also have a nozzle formed in a myriad of ways including as just an example a nozzle formed in a tube. Thus, other than Examiner's conclusory statements there is nothing in the record to establish that Loughman expressly or inherently discloses the subject matter of claims 17 and 18.

In conclusion in regards to the rejection of claims 1-2, 4-8, 11-14, 17-18, 46-47, and 49 under 35 U.S.C. §102(b) as being anticipated by Loughman (WO 99/38535, "Loughman") Appellants submit that the Loughman patent does not teach or suggest each and every element of independent claims 1 and 46-47 for the reasons set forth above in Section A, as well as the reasons set forth in the Appeal Brief filed October

31, 2006. Accordingly, Appellants submit that independent claims 1 and 46-47 are patentably distinct from the Loughman patent. Furthermore, as dependent claims 2-30, 32-34, and 39-41 further define patentably distinct claim 1 and dependent claims 48-56, 58-61, and 66-67 further define patentably distinct claim 47. Appellants further submit that the dependent claims argued above and those argued in the Appeal Brief are separately patentably distinct from the Loughman patent based on the arguments set forth above as well as based on the arguments set forth in the Appeal Brief filed October 31, 2006. Appellants further submit that withdrawn claims 31, 35-38, and 42-45 further define patentably distinct claim 1 and withdrawn claims 57, 62-65, and 68-72 further define patentably distinct claim 47. Accordingly Appellants, respectfully submit that the rejection of claims 1-2, 4-8, 11-14, 17-18, 46-47, and 49 under 35 U.S.C. 102(b) is not correct and should be withdrawn.

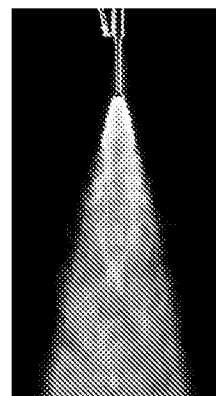
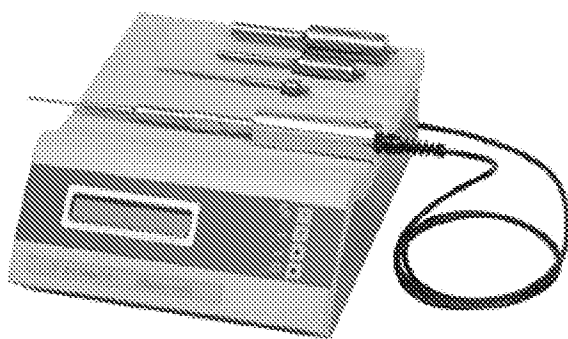
#### **B. Claim rejections - 35 U.S.C. §103**

Appellants continue to assert that the rejection of claims 3, 9-10, and 48 under 35 U.S.C. §103(a) as being obvious over Loughman in view of Boucher (U.S. Patent No. 6,641,254, "Boucher") is improper.

Separate from the interpretation of claim language and whether or not it is disclosed in particular cited prior art references; Appellants assert that it is clear from both the arguments presented by Examiner and Examiner's reliance on inherency in a large number of anticipatory rejections, Examiner appears to not understand the significant differences between an ultrasonic atomizer as disclosed in Loughman and a continuous inkjet or drop on demand type fluid ejection device as claimed by Appellants. Appellants acknowledge that Boucher does disclose "[t]wo widely used energy generating elements are thermal resistors and piezoelectric elements. The former rapidly heats a component in the fluid above its boiling point causing ejection of a drop of the fluid. The latter utilizes a voltage pulse to generate a compressive force on the fluid resulting in ejection of a drop of the fluid." However, such a disclosure does not in and of itself mean that Boucher can reasonably be combined with

Loughman. Separate from what Boucher may or may not disclose Appellants assert that to combine either a thermal drop on demand type device or a piezoelectric drop on demand type device as taught in Boucher with Loughman's ultrasonic atomizer results in a device that Appellants continue to assert would either require significant redesign and modification at best or as Appellants have previously asserted would most likely lead to an inoperative device and therefore teaches away from combining the two references of Loughman and Boucher. Appellants have no idea how these distinctly different devices can be combined in an operative manner. Because Appellants have previously made these arguments, and Examiner in Examiner's Answer has not addressed any of Appellants' arguments made in Appellants Appeal Brief; Appellants now believe that Examiner may be arguing that Loughman's ultrasonic atomizer may during operation eject a single drop. If indeed this is Examiner's position Appellants assert that such an interpretation of Loughman is without merit and clearly erroneous. One need only see an ultrasonic atomizer in operation as shown below to determine that an atomizer does not operate to eject only one drop or even a few drops.

#### Atomizers



- From microliters to liters – continuous or intermittent
- Dispenses material with minimum overspray
- Pressureless atomization – low velocity mist
- 20 kHz and 40 kHz
- wide dispersion probes
- Virtually uncloggable

The image shown above was obtained from the website of Sonics & Materials Inc. having a homepage at <http://www.sonics.biz/>. The actual webpage where the image below was obtained is <http://www.sonics.biz/lp-atomizers.htm>. Appellants note that Loughman discloses the "solutions were fed to a Vibra-Cell VC 50 Atomization nozzle (BioBlock, Illkirch, France using a Masterflex pump (Cole Parmer Instrument Co., Niles, Illinois, USA and nebulization was achieved using a sonication frequency of 12 kHz." Page 17 lines 28-30. What is shown above is a newer model currently sold by Sonics & Materials Inc. Appellants note that it appears the Vibra-Cell VC 50 is no longer commercially available. What Appellants have found is that it appears the actual manufacturer of the Vibra-Cell VC 50 was Sonic & Materials Inc. located in Newtown, Connecticut since Vibra-Cell is a registered trademark of Sonic & Materials Inc.

Appellants continue to assert that the suggestion to combine the references must not require substantial reconstruction or redesign of the reference to arrive at the claimed invention.<sup>17</sup>

Thus, for the reasons set forth above, as well as the reasons set forth in the Appeal Brief filed October 31, 2006, Appellants submit that the combination of Loughman and Boucher taken either individually or in combination does not establish a *prima facie* case of obviousness for claims 3, 9-10, and 48. Appellants, therefore, respectfully submit that the rejection of claims 3, 9-10, and 48 under 35 U.S.C. §103(a) is not correct and should be withdrawn, and that claims 3, 9-10, and 48 should be allowed.

In regards to claims 15-16, 19-28, and 50-55 Appellants note that Examiner on page 2 of Examiner's Answer under Grounds of Rejection to be reviewed on Appeal has restated that claims 50-55 are rejected under 35 U.S.C. §103(a) as being unpatentable over Loughman in view of Boucher. Appellants respectfully disagree

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<sup>17</sup> *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (C.C.P.A. 1959).

with Examiner because claims 50-55 all depend from claim 47 not claim 48. Examiner has used Boucher to reject claim 48 as discussed above. However, since claims 50-55 do not include the elements/limitations found in claim 48 Examiner has in fact only relied on Loughman for rejection of claims 47 and 50-55. Appellants are unaware of any evidence entered into the record relying on any teaching or suggestion found in Boucher for rejecting claims 50-55. Thus, Appellants continue to assert that the rejection of claims 15-16, 19-28, and 50-55 under 35 U.S.C. §103(a) as being obvious over Loughman in view of Examiner's remarks is improper.

As set forth in Appellants' Appeal Brief Appellants continue to argue that the Examiner has cited only a single reference in support of the 103 rejection, which requires a high level of correlation between what is described in the cited reference and the claims proffered in the instant application. Appellants assert that the description in Loughman is insufficient to describe, teach, or suggest the claims of the present application because each and every element and limitation is not explicitly or implicitly stated, unless combined with another reference or the Examiner's personal knowledge. Appellants have requested a "citation of some reference work recognized as a standard in the pertinent art" that supports Examiner's position that Loughman contemplates the subject matter disclosed in claims 50-55. Examiner in Examiner's Answer has not provided any reference or provided any reasoned explanation why such a reference is unnecessary but rather continues to argue that the various motivations Examiner provided are the sole criteria even though no reference is being combined with Loughman. Further, Examiner states at the bottom of page 20 that "Appellants have not clearly point[ed] out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by references cited," even though only one reference is actually cited. Appellants respectfully disagree with Examiner that Appellants must point out "the patentable novelty" of any claim but rather Examiner must establish a *prima facie* case of obviousness which Examiner has not done. Appellants have also requested an affidavit under 37 C.F.R. §1.104(d)(2) if Examiner was relying on Examiner's own knowledge since Examiner did not provide a reasoned explanation of how each of the elements/limitations of claims 15-16, 19-28,

and 50-55 is obvious in view of Loughman. Examiner has provided no affidavit in support of Examiners rejection of claims 15-16, 19-28, and 50-55.

As noted in Appellants' Appeal Brief the burden of establishing a *prima facie* case of obviousness can only be satisfied by a showing of some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references.<sup>18</sup> The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art also suggests the desirability of the modification. Appellants believe that in order to establish a *prima facie* case of obviousness Examiner must provide some reasoned argument more than merely stating it would be obvious to utilize Appellants claim elements/limitations found in claims 15-16, 19-28, and 50-55 when relying on knowledge generally available to one of ordinary skill in the art.

In addition, Appellants note that in regards to claims 15-16, 19-28, and 50-55 Appellants are unsure whether any or all of the limitations set forth in these claims will work with an ultrasonic atomizer. In particular, Appellants are unsure but believe that the claim limitations set forth in claims 19 and 50 will not work with an ultrasonic nozzle, namely immersing said at least one nozzle wherein at least a portion of said nozzle layer is below the surface of said second fluid as claimed in claim 19 and immersing the fluid ejection device a pre-selected distance in said second fluid as claimed in claim 50. Appellants believe that an ultrasonic atomizer when inserted into a solution will act as a homogenizer and will not generate a spray of droplets within the solution. Further, if one were to immerse the ultrasonic atomizer in the second solution then the first solution would quickly freeze within the atomizer because Loughman teaches that the second fluid is cooled to a temperature of -50 C to -80 C so that the nebulization droplets will freeze immediately on contact with the slurry. Page 10, lines 30-35 of Loughman. Appellants are also unsure what the effect of

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<sup>18</sup>See *In re Fritch*, 972 F.2d 1260, 23 USPQ 2d 1780, 1783 (Fed Cir. 1992).

laterally moving an ultrasonic atomizer over the second fluid will be on the operation of the of the ultrasonic atomizer as well as on the properties of microdroplets formed by a moving ultrasonic nozzle laterally over a solution.

Thus, in regards to dependent claims 15-16, 19-28, and 50-55 Appellants assert that Examiner has not provided a *prima facie* case of obviousness. Accordingly, rejection of claims 15-16, 19-28, and 50-55 under 35 U.S.C. §103(a) in respect to Loughman in view of Examiner's remarks is improper.

### **CONCLUSION**

For the above reasons, in addition to those reasons set forth in the Appellants' Appeal Brief, Appellants respectfully submit that the cited art neither anticipates nor renders the claimed invention obvious, and therefore the claimed invention does patentably distinguish over the cited art. Therefore, Appellants respectfully submit that the rejections to pending claims 1-72 are in error, and Appellants respectfully request that the Board reverse the Examiner and find all pending claims allowable.

Appellant respectfully requests the timely issuance of a notice of allowance indicating that claims 1-72 are allowed.

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Date: 23 April 2007